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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/765,916	01/18/2001	Frederic Canut	260/087	8270

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BINGHAM, MCCUTCHEN LLP
THREE EMBARCADERO, SUITE 1800
SAN FRANCISCO, CA 94111-4067

EXAMINER	
KANG, INSUN	

ART UNIT	PAPER NUMBER
2124	

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/765,916	CANUT ET AL.	
	Examiner	Art Unit	
	Insun Kang	2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10/18/2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is responding to amendment filed 10/18/2004.

2. As per applicant's request, claims 1, 3, 12, 14, 16, and 25 have been amended. Claims 1-26 are pending in the application.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Per claims 1 and 14, it is unclear as to which at least one portion in the 'c' section it is referring. It is interpreted as the at least one portion. As per claims 2-13 and 15-26, these claims are rejected for dependency on the above rejected parent claims 1 and 14.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-3, 8-16 and 21-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pieper et al (US 2003/0005419) in view of Steinmetz et al. (US Patent 5,812,854) hereinafter referred to as "Steinmetz."

Regarding claim 1:

Pieper et al. disclose: a method of optimizing a software program for a target processor to meet performance objectives, where the software program is coded in a high-level Language (par. 0019; par. 0020), the method comprising the steps of: (a) optimizing the software program such that a resulting first optimized form of the software program is at least partially independent of the target processor and is at least partially coded in the high-level language (par. 0020; 0030); (b) optimizing the first optimized form of the software program such that a resulting second optimized form of the software program includes at least one portion that is dependent on the target processor and is coded in the high-level language (par. 0031, 0020);

Pieper et al. do not explicitly disclose flagging at least one portion to indicate that the at least one portion is dependent on the target processor. However, Steinmetz teaches that using flags was known in the art of software development and optimization, at the time applicant's invention was made, to mark or identify some portions or whole code as an event of some type or having a special purpose or capability ("any pseudo-ops present in the user-defined machine-dependent code input," col. 9 lines 25-41; "the user-defined machine code input...could contain a pseudo-op directing the compiler to leave a group of instructions in a predetermined order...the pseudo-op flags group of

instructions so the compiler will not reorder them even if the compiler believes such a reordering would be more efficient... to have more control over how the compiler optimizes the code, particularly how it optimizes the machine dependent user-defined code input," col. 10 lines 1-25). It would have been obvious for one having ordinary skill in the art of computer software development and optimization to modify Pieper et al.'s disclosed system to flag the modified target dependent code. The modification would be obvious because one having ordinary skill in the art would be motivated to identify the target specific code for efficient optimization and portability ("any pseudo-ops present in the user-defined machine-dependent code input would also be converted to a form compatible with machine-dependent intermediate code... to serve as compiler directive mechanisms during machine-dependent optimizations," col. 9 lines 25-41; "The next step... is to translate the integrated and optimized code into machine code form that can be read by the target computer system. Thus, the resulting machine code is well integrated and optimized. This results in code with fast and efficient performance," col. 10 lines 26-31) as taught by Steinmetz.

Regarding claim 2:

The rejection of claim 1 is incorporated, and further, Pieper et al. disclose: (al) determining a first performance profile for the first optimized form of the software program, and comparing the first performance profile with the performance objectives (par. 0031; par. 0045); and (bl) determining a second performance profile for the

second optimized form of the software program, and comparing the second performance profile with the performance objectives (par. 0032; 0044) as claimed.

Regarding claim 3:

The rejection of claim 2 is incorporated, and further, Pieper et al. disclose:

-optimizing the second optimized form of the software program such that a resulting third optimized form of the software program is at least partially dependent on the target processor and includes portions coded in a low-level language of the target processor (par. 0031) as claimed.

Regarding claim 9:

Pieper et al. further disclose the act of implementing reference code comprises code profiling (par. 0031, 0042 ; 0046 ; 0048 ; 0049 ; 0052) as claimed.

Regarding claim 8, this claim is another version of the claimed method discussed in claim 9, wherein all claim limitations also have been addressed and/or covered in cited areas as set forth the above.

Regarding claim 10:

The rejection of claim 1 is incorporated, and further, Pieper et al. disclose :

-the act of optimization predicted to improve resulting assembly code ("In generating the code, generator modifies the code such that code reflects scheduling and other low-level optimizations of the code, which are dependent on the target processor architecture," 0031; 0032; 0009).

Regarding claim 11:

The rejection of claim 1 is incorporated, and further, Pieper et al. disclose the act of tuning low-level functions (0031) as claimed.

Regarding claim 12:

The rejection of claim 1 is incorporated, and further, Pieper et al. disclose the act of manual assembly optimization. Hand-coded assembly for optimized performance is necessary for performance critical routines such as graphics or math library routines as they often must access low-level machine instructions for optimal execution performance. Therefore, accordingly, Pieper et al. anticipate this claim. See also 0009 and 0018.

Regarding claim 13:

The rejection of claim 1 is incorporated, and further, Pieper et al. the act of feature tuning (0031; 0032).

Per claims 14-16 and 21-26, they are the computer-readable medium versions of claims 1-3 and 8-13, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-3 and 8-13 above.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 4-7 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pieper et al (US 2003/0005419) in view of Steinmetz et al. (US Patent 5,812,854) and further in view of Kum et al (0-7803-5041-3/99, IEEE).

Regarding claim 4:

The rejection of claim 1 is incorporated, and further, Pieper et al. and Steinmetz et al. do not explicitly teach a floating-point implementation. However, Kum et al. disclose deriving a floating point implementation (pg 2163, introduction, par. 3, "the ranges of floating point variables are estimated by the simulation of the range estimation program that is automatically generated from the original floating-point version," see also Figure 1) for the purpose of automatic scaling of all numbers so that the numbers use the full word length available and for the purpose of reducing the risk of overflow. Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the teachings of Kum et al. to the system of Pieper et al and Steinmetz et al. The modification would be obvious to include the floating-point implementation because of the automatic scaling of each number to use the full word length of the mantissa so that accurate representation of numbers can be obtained while minimizing the risk of overflow and quantization errors (pg 2163, introduction, par. 3).

Regarding claim 5:

The rejection of claim 1 is incorporated, and further, Pieper et al. and Steinmetz et al. do not explicitly teach a fixed point implementation. However, Kum et at. disclose the method of claim 1 in which step (a) comprises the act of deriving a fixed point implementation so that "assembly coding and manual scaling can be avoided and the translated C programs are executed very efficiently" in fixed-point DSPs (pg 2163, Introduction, lines 1-15). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the teachings of Kum et al. to the system of Pieper et al and Steinmetz et al. The modification would be obvious to include the fixed-point implementation so that round-off errors can be prevented and target dependent scaling shift can be minimized while obtaining fast real-time processing with less power and memory usage (pg 2163, Introduction, lines 1-15).

Regarding claim 6:

The rejection of claim 5 is incorporated, and further, Pieper et al. and Steinmetz et al. do not explicitly teach the act of processing qualification. However, Kum et al. further disclose the act of processing qualification (Introduction, par.3; simulation-based integer word-length determination, pg 2165, shift reduction, par. 10; pg 2163, par. 6; pg 2166, Concluding remarks) so that cost effective and high quality fast real-time processing with less power and memory usage can be obtained while reducing quantization noise (Introduction, par.3; simulation-based integer word-length determination, pg 2165, shift reduction, par. 10; pg 2163, par. 6; pg 2166, Concluding remarks). Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate the teachings of Kum et al. to the system of Pieper et al and Steinmetz et al. . The modification would

be obvious to include the act of processing qualification for the purpose of high quality processing with minimized quantization noise.

Regarding claim 7:

The rejection of claim 5 is incorporated, and further,, Pieper et al. and Steinmetz et al. do not explicitly teach the act of implementation sizing. However, Kum et al. further disclose the act of implementation sizing (abstract; Introduction, pg 2163, par.3; pg 2163, simulation-based integer word-length determination) by program-profiling results (pg 2164-2165, Sift reduction) so that estimation of code size for the target can be obtained and the risk of overflow can be prevented. Therefore, it would have been obvious to a person having ordinary skill in the art to incorporate the teachings of Kum et al. to the system of Pieper et al and Steinmetz et al. The modification would be obvious to include the act of implementation sizing for the purpose of code size estimation so that the risk of overflow can be prevented (pg 2164-2165, Sift reduction).

Per claims 17-20, they are the computer-readable medium versions of claims 4-7, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 4-7 above.

Response to Arguments

9. Applicant's arguments filed 10/18/2004 have been fully considered but they are not persuasive.

Per claims 1 and 14:

The Applicant states that:

Steinmetz teaches using pseudo-op to flag group of instructions such that an operation of a compiler can be controlled. However, there is nothing in Steinmetz that discloses or suggests flagging a portion of a code *to indicate that the portion is dependent on a target processor* (page 9).

In response, the examiner points out that Steinmetz discloses "any pseudo-ops present in the user-defined machine-dependent code input ...to serve as a compiler directive mechanisms during a machine-dependent optimizations (col. 9 lines 25-41)." Further, the claim recites flagging a portion of the code to indicate that the portion is dependent on a target processor. The claim does not include a description of what the flagging function actually was or did, with respect to how the indicating was conducted. Causing an action or intended action is different from actually performing an action. Flagging to indicate something does not necessarily mean that the indicating step is actually performed. The flagging step is only **for** indication of the target dependent portion. Therefore, Steinmetz's "any pseudo-ops present in the user-defined machine-dependent code input (col. 9 lines 25-41)" is considered to indicate that the portion is dependent on a target processor. Accordingly, the rejections of claims 1 and 14 are considered proper and maintained.

Per claims 2-13 and 15-26:

The applicant states that 2-13 and 15-26 are allowable as being dependent on allowable base claims. As has been shown above, the rejections of the independent claims 1 and 14 are proper, the argument that claims 2-13 and 15-26 are allowable as being dependent on an allowable base claim is considered moot.

Accordingly, the rejections of claims 2-13 and 15-26 are considered proper and maintained.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Insun Kang whose telephone number is 571-272-3724. The examiner can normally be reached on M-F 9:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on 571-272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

I. Kang
11/23/2004

TODD INGBERG
PRIMARY EXAMINER